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United States Patent [19]

Prater et al.

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[54] **SCANNING STYLUS ATOMIC FORCE MICROSCOPE WITH CANTILEVER TRACKING AND OPTICAL ACCESS**

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5,714,682 2/1998 Prater et al. 73/105

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[*] Notice: This patent is subject to a terminal disclaimer.

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Related U.S. Application Data

[63] Continuation of application No. 08/871,029, Jun. 9, 1997, which is a continuation of application No. 08/679,332, Jul. 11, 1996, Pat. No. 5,714,682, which is a continuation of application No. 08/416,100, Apr. 4, 1995, Pat. No. 5,560,244, which is a continuation of application No. 08/107,017, Aug. 17, 1993, Pat. No. 5,463,897.

[51] **Int. Cl.⁷** **G01B 5/28**

[52] **U.S. Cl.** **73/105**

[58] **Field of Search** 73/105; 250/306,
250/307

[56] **References Cited**

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[57] **ABSTRACT**

A scanned-stylus atomic force microscope (AFM) employing the optical lever technique, and method of operating the same. The AFM of the invention includes a light source and a scanned optical assembly which guides light emitted from the light source onto point on a cantilever during scanning thereof. A moving light beam is thus created which will automatically track the movement of the cantilever during scanning. The invention also allows the light beam to be used to measure, calibrate or correct the motion of the scanning mechanism, and further allows viewing of the sample and cantilever using an optical microscope.

20 Claims, 8 Drawing Sheets